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The Art of Plate Spinning – a Study of Clinician-scientists' Translational Work Practices in a Danish Hospital Setting

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Clinician-scientists as key actors in translational research

Translational research is subject to increasing attention in research and health policy. While clinician-scientists often are positioned as key actors in the debates, less is known about the everyday work of clinician-scientists, their practices and commitments at the interface of academia and clinical health care. Drawing on the framework of arena analysis developed in situational analysis, this article presents an empirical exploration of the translational research practices of clinician-scientists in a Danish hospital setting.

The findings shed light on translational research as constituted by multiple practices and a complex of commitments and capabilities. While the importance of this role has been addressed thoroughly, only few empirical studies focus on clinician-scientists' practices, the ways in which clinician-scientists actually carry out day-to-day hospital-based translational research work.

Clinician as hybrid professional?

Research setting

The setting for the research is Region Zealand and in particular two research networks based in the hospitals in the region. These research networks connect different research projects or research protocols within a joint vision of changing and improving diagnosis and/or treatment within a given area. The two research networks lie within two very different medical areas, psychiatric diagnosis and cancer treatment. I selected these two research networks based on a completed research evaluation of all departments in the regional hospitals in which research and translational activities have been mapped. The networks are exemplary in that one network is at an early career start-up phase based in a department with sparse prior research, and the other comprises more established researchers in departments where research capacity was stronger and expanding.

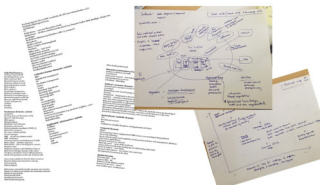
Region Zealand headquaters in Sorø, Denmark
Region Zealand is one of the five regions in Denmark responsible for running and developing the five hospitals in the region.

Methods

Data collection was conducted between January 2018 and March 2019 and comprised interviews, observations and collecting of organizational and project documents. Observations included selected research team meetings, public presentations of research, academic conferences, research seminars, patient testing and treatment and lab visits. 20 in-depth interviews were conducted with primarily clinician-scientists as well as team members (e.g. Ph.D. students, a biologist, an engineer) and department managers.

Throughout the research project, the author was simultaneously working as a consultant in a crosscutting research and innovation support unit at the hospitals, which involved visits, meetings, workshops and communication with staff and management at the hospital departments on other issues related to research development and support in the region.

The interview, transcripts, notes and documents were analysed using situational maps (Clarke, 2005) as an analytical tool. Following situational analysis, draft situational maps, arena maps, and positional maps were created to visualize and organize data and to allow for discussing ongoing analysis ideas with colleagues and informants. Data was stored, organized, and coded in the qualitative data analysis software NViVo.



Iterative analysis with situational maps

Theory

Situational analysis rests upon a theoretical understanding of knowledge as always embedded and enacted in the situations of which it is a part (Clarke, 2005). In this understanding, knowledge is always incorporated in practices, procedures, techniques and technologies. The focus here is therefore specifically on the practices of key actors, on what clinician-scientists do and how they do it. This approach builds on grounded theory and constructionism and has as a main unit of analysis the relations among actors.

I apply "arena analysis", one tool in situational analysis, as a form of complexity mapping of the way in which commitments and capabilities are organized around the clinician-scientists. What are the patterns of collective commitment? How do the clinician-scientists go about fulfilling these commitments? Arenas are characterized by Clarke as multiple, complex and layered discourses, groups of actors (human and non-human), knowledges and practices that persist over time (Clarke, 2005; 125). They are sets of practices (committed to and bounded by collective action/work of some kind) and not necessarily formal organizations.

Data matrix mapping
Seven analytical dimensions as a way of mapping the work of clinician-scientists and how it is organized.

Arena/characteristics	Sites of organized action/ associated formal organizations	Key focus and commitments (of CS in relation to the arena)	Primary activities (of the CS in relation to the arena)	Work objects and technologies	Specialized knowledges	Key performance indicators
Hospital clinical	Hospital departments, clinics, medical specializations as defined by National Health Board, specialization boards and consortiums (eg. for standard procedures and guidelines), specialized clinical networks	Patient diagnosis and treatment, evidence, specialization, guidelines and standards, patient flow, relations to teams/staff (duties, tasks etc.)	Patient consultations, staff meetings, medical conferences, team meetings, courses, seminars	Patient-journals, diagnostic and treatment-tools, evidence base, treatment guidelines, the national six-year ward, hierarchies, organization, medicines and equipment	Medical education and culture, local clinic culture, use of specialisms and clinical decision making tools, adherence to guidelines, medical experience and judgement	Target number and speed of patients diagnosed and treated in department, departmental budget, bottlenecks
Hospital management	Regional management, hospital management, department management, National Health Board, specialization boards	Patient and financial statistics, input-output measurement, evidence based, reducing unwanted variation, standardizing, budgets, patient involvement in tx's, moving research results into practice when evidence is sufficient	Meeting, documenting, aligning research agendas to management agendas, research budgets, reporting, documentation	Research applications, research protocols and budgets, presentations, meetings, emails and negotiation, recommendation reports, SOP documents, guidelines documents, applications to the National Health Board	Ability to translate or align research plans to management agendas, evidence-based medicine, statistics, cost-benefit analysis	Standardized evidence-based treatment implemented, cost-benefit calculations, projected and actual savings / improvements, new guidelines for clinical practice, recruitment of qualified staff
Cross-disciplinary collaboration	Hospital departments, medical specializations, geographical proximity, seminars, personal and professional networks, regional politics and agendas, research networks, specialized national and international research organizations and networks, seminars, conferences, retreats, committees, working groups, courses	Multidimensional research to annex "the bigger picture", regional and national research politics, funding	Meetings, seminars, courses, joint applications and publications, personal networks	Protocols, collaboration agreements, contracts, funding applications, journal articles, data and analysis materials, patients, access to training equipment, phd. students (joint supervision)	Specializations, subspecialization, contributory expertise eg ability to gain interactional expertise in another area, interdisciplinarity	Formalized collaboration agreements/contracts, formalization of network and groups (e.g. REB, COS)
National and international research /community		Knowledge exchange and collaboration, furthering research agenda area, finding the right partners	Programs, presentations, seminars, courses, access to lab or infrastructure	Websites, databases, journals, email exchange, collaboration contracts, joint publication and funded projects	Networking and collaboration	Number of seminars, conferences, courses, joint applications and grants, invitations, exchanges
Project management	Project groups, research consortiums	Successfully achieving defined goals of a project, QA management	Coordination, collaboration, communication	Project applications, work package plans and budgets, email, calendars, consortium agreements	Project management skills	Report e.g. to grant funding agency, achievement of project milestones
Funding	Funding providers (international, national, regional, public, private)	Continually securing funding for future projects, reporting on funding received	Finding partners, establishing collaboration, co-writing applications, project management work, reporting, networking with foundations	Websites, databases, calls, application, reviews, reporting, project management tools	Writing, funding genre and strategy, project work and management	Number eg applications sent, number of successful applications, amount of funding received
Finance and audit	Local administration and finance departments	Ability to use grants and funds, overview reporting	Negotiating with finance for opening local research accounts, transferrings funds, adhering to different requirements eg funders	Budgets, contracts, accounts, financial IT systems, reporting systems	Negotiation, brokering, financial skills	Funds granted are spent, regulations adhered to
Publishing	Research networks, journals, publishers, peer-review systems, bibliometric systems	Publication submission and strategy, co-authorships, framing research problem, balancing specialization with cross disciplinarity	Reading and writing, co-authorship, citation, building the CV, graphics and cocreperations	Publications, databases, CVs, bibliometrics	Publication strategy, bibliometrics, international networks	Number of articles, rating of publisher, citations and bibliometrics
Teaching, supervision and mentoring	Partner supervision/teaching arrangements at university/university clinic, colleague sparring in the clinic, senior-junior research networks	Educating juniors in relation to medical practice and research, PhD. supervision	Teaching, supervision, mentorship	Teaching materials	Role of mentor and mentee, communication and pedagogy, newest evidence and research within given area	Number of scholarstudents, phds, medical students, phd courses
Public communication	National and international media, twitter, facebook, websites, research portals, public events, public debates,	Framing research in public and research results wisely, accessible, attractive, securing support for the research, promotional work, establishing legitimacy	Maintaining website, research profiles, media hooks, twitter, facebook, research portals, public events, seminars	TV channels, websites, newspaper, magazines, twitter, facebook, research portals, public events, seminars	Science communication to public, ensuring the correct story is brought in media	Number of (correct) appearances in media
Industry	Firms (DK and abroad (note that projects studied were "investigator-initiated")	Collaboration, access to equipment, , furthering results into products and commercialization	Meetings, procurements, contracts, instructions, mentioning by experts, setting up, networking, access to funding for newest technologies	Contracts, budgets, specifications	Collaboration, understanding and navigating in multiple interests, bargaining	Contracts, sponsorship/price reductions of eg. equipment
Technical apparatus	Training seminars, courses, education, events	Access to newest equipment, techniques, tools, cannot use and set up, often according to standards	Technologies, techniques, tools, licenses, guidelines	Technical knowledge or apparatus experience, engineering, physics	Technical knowledge or apparatus experience, engineering, physics	Invented, tested and ready for use/research, access agreement in place, patents, products on market
Laboratory	Safe internal atmospheric, external at universities or firms	Safety, lab set-up, available equipment and techniques, tools, experts, ethics and regulation, certifications	Meetings, contracts, transport of data materials, safe use, location, equipment, transport of materials, certification	Biology, chemistry, engineering, physics etc.	Lab certification, lab access agreement/contract	
Ethics and regulation	National and regional ethics committees, Data protection authority, data protection firms, clinical trials database, intermediary administrative regulation organizations local and national	Health research (on human subjects) is considered ethical and carried out according to regulations and thus legally regulated	Applications, approvals, guidelines, administrative systems, peer-to-peer learning or professionalization of the application "pipeline" and access to to conference projects	law, templates and applications, approvals, databases,	Completing formalized various applications, "speaking the "genre" of ethics-approval	Approvals achieved and adherence to regulations if monitored
Patients	Not organized - can be grouped through patient registry systems by e.g. by diagnosis and stages in diagnosis/treatment, demographic data etc.	Diagnosis, treatment, recruitment into research projects, keeping them recruited throughout project, patient involvement	Patient consultations and treatment, trials, presenting/explaining research to patients, finding methods to involve patients	Patient-journals, diagnostic tools, evidence base, treatment guidelines, the national six-year ward, research protocols, patient information flyer and materials on research project, body parts, tissue, blood, scans, tests etc.	Medical education, medical experience, patient and next of kin communication, understanding the experiences of living with the conditions they have	Number of patients included and kept in protocols, number of patients involved in research
Patient organizations	Various danish and international patient organizations	Patient interests and rights, patient involvement, furthering research in a given area or niche, funding, research collaboration, patient recruitment	Meetings, seminars, conferences, presentations, communicating, visibility in media	Reports, presentation	Networking, collaboration, communication of research to public, aligning research to patient organization priorities	Public presentation and communication of research, quality of applications, projected impact of research, number and scope of patient involvement in research

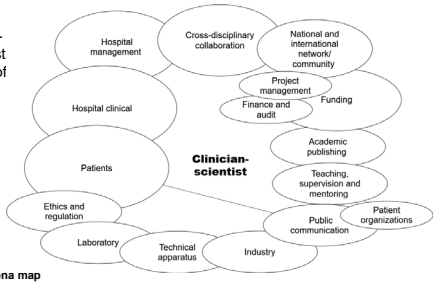
Analysis

Fourteen arenas were mapped in the study; *Hospital clinical, Hospital management, Cross-disciplinary collaboration, Patients, Ethics and regulation, Public communication, Industry, Finance and audit, Laboratory, Technical equipment, Publishing, Funding and Teaching and supervision.*

The findings of the study point to a complex of practices and situations where research and clinic play together and into one another. The complex and multifaceted character of this work is sought highlighted and foregrounded and the analysis thus points to an underexplored characteristic of hospital based translational research practices - the ability of clinician-scientists to navigate multiple (not only dual) arenas, to meet many varying demands and to deal with the dilemmas and tensions involved.

Working with and bringing together multiple arenas is an aspect of work as a clinician scientist engaged in translational research that tends to be overlooked in a dualistic understanding of translational research as the bridging of two separate domains – or in the understanding of the clinician-scientist as a translator between the two. This prevalent conceptualization may render other important arenas less visible as well as obscure the many ways in which a research-clinic relationship can play out in practice.

This analysis of the multiple ways of doing of translational research also turns our attention more towards the relations, interactions and exchanges that seem to move research forward while making it relevant. In this sense translational research might be reframed *transactional research* in order to better address the collaborative relations and transactions seem to be key in order to produce the very "translational effects" that are of political interest and expectation.



Arena map
Spatial illustration of how clinician-scientists are engaged in a complex of multiple arenas.

Conclusion

A large body of literature discusses a gap between research and clinic, how effective relationships between the two can be modelled, how the gap can be bridged or how knowledge can be packaged and transferred most effectively. Few studies focus on the actual daily research-clinic interplays and the work practices of clinician-scientists at this nexus. The findings of the exploratory study presented shed light on the ability of the clinician-scientists to continuously perform in these multiple arenas, to live up to the multiple demands and capabilities required.

Combined, this multiple performance constitutes translational research and a complex of situations where research and clinic in many different ways play into one another and together. This view of the practices of clinician-scientists refines our understanding of translational research. Rather than an image of the clinician-scientist as an actor with a foot in two worlds, as prevalent in the literature, the analysis sheds light on continuous, multiple and quite varied practices of commitments and collaboration that together move hospital-based research forward. In conclusion, the spatial metaphor of arenas configures a different view of how a set of many different commitments and capabilities, and their negotiations, contributes toward making research relevant in a health care hospital setting.

Implications for policy

Suggestions for improved support for clinician scientists could include more "protected time" for research as well as protected time for nurturing relations and interplay. The study also confirms calls for better managerial and institutional support for communication and collaboration within the department, across departments and organizations as well as internationally. A new and interesting path for further research and policy might also be to explore the ways in which organizations can recognize and make visible the transactional practices that seem to characterize the work of clinician-scientists. These subtle commitments and capabilities, as exemplified in this paper, are difficult to delineate and measure in the form of performance indicators – they thus constitute a set of practices that are difficult to make accountable.

Paradoxically, adding more performance demands, more obligations and expectations for this groups of actors to live up to, might not be fruitful in a situation where clinician-scientist already are strung out by multiple arenas. How policy can account for, evaluate and support this type of transactional work thus calls for further research.

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